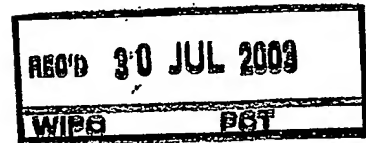


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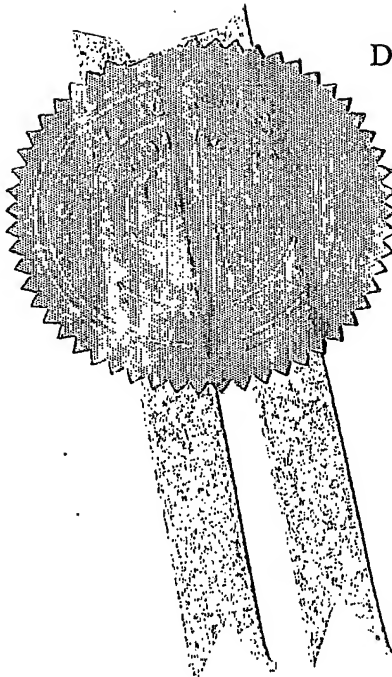
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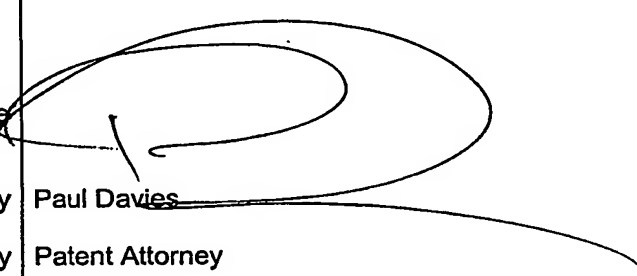
Patents (General) Rules sections 58, 74

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01 Your reference	9868285:P/D:HALE:sk
02 Applicant's details (see note (4)(a)) Name (underline surname) Name in Chinese (if applicable) Address Telephone Fax Kind of incorporation Country of incorporation State of incorporation (if applicable)	CHAN, Wing Kin 陳永堅 Block A-C, 4/F., Wing Hin Factory Building, 31-33 Ng Fong Street, San Po Kong, Kowloon
03 Title of invention (see note (4)(b)) English Chinese	Improved Food Processing Apparatus 2002 (5)

04 Details of International Patent Classification <i>(see note (5))</i>	IPC Code F24C, A23B ^{see (4)}	IPC Edition No. 7
05 Use of micro-organisms <i>(tick the appropriate box)</i> <p>(a) Does the invention require the use of a micro-organism for its performance?</p> <p>(b) If you have ticked "Yes", please indicate whether the micro-organism is available to the public at the date of filing of the application; and whether the micro-organism is described in the application or the specification of the patent in such a manner as to enable the invention to be performed by a person skilled in the art.</p> <p>(c) If you have ticked "No" in both boxes in (b), please give the following details:</p> <p>Name and address of the depositary institution where a culture of the micro-organism is deposited</p> <p>Date of deposit <i>(Day/Month/Year)</i></p> <p>Accession No. of the deposit <i>(section 73 and Schedule 1, Patents (General) Rules)</i></p>	<div> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div> <div> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div> Name: Address: </div> <div> </div> <div> </div>	
06 Details of international application If the short-term patent application is based on <p>(a) International Application No.</p> <p>(b) International Filing Date <i>(Day/Month/Year)</i></p> <p>(c) International Publication No.</p> <p>(d) International Publication Date <i>(Day/Month/Year)</i></p> <p>(e) Date of entry into the national phase in the People's Republic of China</p> <p>or</p> <p>Date of issuance of the National Application Notification by the State Intellectual Property Office</p> <p><i>(tick the appropriate box and enter the date in the space provided)</i></p>	<div> </div> <div> </div> <div> </div> <div> </div> <div> <input type="checkbox"/> _____ <i>(Day/Month/Year)</i> </div> <div> or </div> <div> <input type="checkbox"/> _____ <i>(Day/Month/Year)</i> </div>	

<p>(f) Application No. of the Chinese patent application (if known)</p> <p><i>(section 125, Patents Ordinance and section 78, Patents (General) Rules)</i></p>									
<p>07 Details of earlier application If the application is divided or derived from an earlier Hong Kong application</p> <p>(a) Section under which an earlier application is claimed <i>(see note (6))</i> <i>(tick the appropriate box)</i></p> <p>(b) Earlier Application No.</p> <p>(c) Earlier Application Filing Date <i>(Day/Month/Year)</i></p>	<p style="text-align: center;">Patents Ordinance</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <input type="checkbox"/> section 116 </div> <div style="text-align: center;"> <input type="checkbox"/> section 55 </div> </div>								
<p>08 Details of the priority application If a statement of claim of priority under section 111, Patents Ordinance is made <i>(sections 58(5)(c), 69, Patents (General) Rules)</i></p>	<p>Statement</p> <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 33%;">Country</th> <th style="width: 33%;">Priority Application No.</th> <th style="width: 33%;">Priority Application Filing Date</th> </tr> </thead> <tbody> <tr> <td style="height: 50px;"></td> <td></td> <td></td> </tr> </tbody> </table>			Country	Priority Application No.	Priority Application Filing Date			
Country	Priority Application No.	Priority Application Filing Date							
<p>09 Details of inventor <i>(see note (4)(a))</i> <i>(see note (7))</i></p> <p style="text-align: right;">Name <i>(underline surname)</i></p> <p style="text-align: right;">Name in Chinese <i>(if applicable)</i></p> <p style="text-align: right;">Address</p>	<p>CHAN, Wing Kin 陳永堅</p> <p>Block A-C, 4/F., Wing Hin Factory Building, 31-33 Ng Fong Street, San Po Kong, Kowloon</p>								
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<p>13 Name of agent <i>(if you have one)</i></p> <p>Address for service in Hong Kong</p> <p>Telephone</p> <p>Fax</p> <p>Agent's code <i>(if known)</i></p>	<p>Deacons</p> <p>3rd-7th, 18th & 29th Floors, Alexandra House, Central Hong Kong</p> <p>2825 9336 (Hans Lee)</p> <p>2810 0431</p>
<p>14 I/We request the Registrar to grant a short-term patent.</p> <p>Signature</p> <p>Name of signatory</p> <p>Official capacity of signatory</p> <p>Date <i>(Day/Month/Year)</i></p>	 <p>Paul Davies</p> <p>Patent Attorney</p> <p>25/06/2002</p>

Notes

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IMPROVED FOOD PROCESSING APPARATUS

FIELD OF INVENTION

The present invention relates to food processing apparatuses and, more
5 particularly, to food processing apparatuses with heating means as well as food
curing means. More specifically, of course not solely limiting thereto, the present
invention relates to an oven with means to smoke-cure a food product.

BACKGROUND OF THE INVENTION

Smoke-cured food products are widely enjoyed by many people around the
10 world. However, smoke-cured products are usually prepared by specialized
kitchens or shops equipped with specialized equipment of facilities which are
usually expensive and bulky. Furthermore, smoke-curing of food products by
conventional ways usually require a continuous and prolonged supply of smokes
having a strong smell which is not acceptable in a domestic environment.

15 Hence, it will be highly desirable if food processing apparatuses with
means to cure food products by appropriate smokes can be made available for
domestic use or for smaller scale applications. In achieving this objective, a pre-
condition for the possible realization of such apparatuses is probably the
continuous supply of the appropriate food-curing smoke as well as resolving the
20 problems associated with the discharge of strongly-smelled smoke in domestic or
city environment.

In this regard, it would be appreciated that a mouth-watering flavour for one person may be a nuisance or a source of allergy for other people. Therefore, a considered discharge of strongly smelled smokes will be an important factor, if not a critical one, to attain the design and development of food processing apparatus meeting the aforesaid objectives generally. Furthermore, while conventional ways of food curing food by smoking always take a long time, for example, a few days, it has been observed that curing food products, for example, meats and vegetables, while the food products are being heated or cooked will add a reasonable level of flavour to the food products being cooked in a time compatible with typical cooking. In some instances, it is known that curing meat with appropriate smoke or other curing substances during cooking may make the meat more succulent and tender.

Hence, it will be highly beneficial if food processing apparatuses can be provided with means to smoke-cure food products in a small scale or domestic environment. In this regard, it would be highly desirable if such food processing apparatuses do not emit or discharge strongly-smelled food curing smokes during or after a food curing process. Furthermore, it will be highly desirable if food processing apparatuses with means to cure food products, by introducing flavour to the food products by flavouring smokes or other appropriate food curing substances, during the cooking of such food products, can be provided.

SUMMARY OF THE INVENTION

According to the present invention, there is provided a food processing apparatus with a main housing including a food processing compartment, electrical heating means, food curing circulation means and food curing substances removal means, said food curing circulation means includes food curing substances
5 dispensing means for dispensing food curing substances into said food processing compartment and air moving means for circulating said food curing substances inside said food processing compartment, said food curing substances removal means includes means to remove said food curing substances from said food processing to outside said main housing.

10 Preferably, said food substances removal means includes absorption means for absorption said food curing substances at the downstream outlet of said food substances removal means.

Preferably, said absorption means includes a deodorizing filter.

Preferably, said main housing further includes a confined channel with an air
15 inlet and an air outlet, said confined channel being in communication with an air moving device, said air moving device being disposed to move said curing substances from said air inlet to said air outlet through said confined air channel and for subsequent circulation in said food processing compartment.

Preferably, said food curing substances removal means includes an air
20 channel in communication with said air moving device.

Preferably, a flow control means is provided to selectively connect said air moving device to be in communication with said air channel of said food curing substances removal means or said air channel of said air moving means which forms a part of the circulating path of said food curing substances within said food processing compartment.

Preferably, said flow control means includes a two-way valves.

Preferably, flow control means are provided to selectively and alternatively activate said food curing circulation means or said food curing substances removal means.

10

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of a food processing apparatus will be explained in further detail by way of example and with reference to the accompanying drawings, in which:-

Fig. 1 shows a front view of a preferred embodiment of the food processing apparatus of the present invention,

15

Fig. 2 is a schematic cross-sectional view taken along the line A-A illustrating the relative arrangement of the curing substances dispensing means and the food curing substances extraction or removal means,

Fig. 3 is a cross-sectional view taken along the line B-B of Fig. 2 and viewed from the top of Fig. 2, and

20

Fig. 4 is a cross-sectional view from the right side of Fig. 3 and taken along the line C-C for illustrative purpose.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the Figures, there is shown a food processing apparatus 10 including a main housing 20, a food processing compartment 30, food curing substances circulation means, food curing substances removal means and electrical heating means. The main housing 20 is preferably made of a metal casing which forms an enclosure surrounding the top, bottom, lateral sides and the back of the food processing compartment 30. The front portion 21 of the main housing is preferably made of a heat resistant transparent material such as glass to form a re-closable window so that a user can see through the transparent window to observe the processing conditions of the food products inside the food processing compartment.

Control means such as control knobs 22 for controlling power level, temperature, air circulation or fan speed and, etc. are provided on the front portion of the main housing adjacent to the transparent window. This front portion is preferably made of insulated metal casing similar to the other parts of the main housing 20. The bottom portion of the main housing 20 is preferably supported above a supporting surface to avoid damaging of the supporting surface due to prolonged contact of the heated compartment with that supporting surface. A removable supporting shelf 31 is preferable supported inside the compartment 31 and located intermediate between the top 22 and bottom 23 portions of the food

processing compartment 30 for cooking and curing food products. This supporting shelf 31 is preferably perforated so that air can pass through the supporting shelf and move around the food processing compartment substantially unobstructed. The supporting shelf can be made in the form of a grille, a meshed wire screen, a perforated plate or other similar structures which allow substantial through passage of air. The transparent front window 21 is preferably hinged to the main housing 20 and is preferably provided with sealing means to minimise or alleviate the escape of smell or odour from the food processing compartment 30. In general, the main housing 20 will have a general design similar to the housing or casing of a conventional electrical oven commonly found in homes, offices, restaurants or other similar establishments.

A food curing substances dispensing means, which is a dispenser 40 for dispensing food curing smoke in the present embodiment, is placed within the main housing 30 and in communication with the food processing compartment 30. To receive the dispenser 40, a smoke dispenser receiving compartment is formed in the main housing adjacent to and in communication with the food processing compartment 30. The smoke dispenser can, for example, be a container carrying burning charcoal, hickory, wood or other combustible substances or medium suitable for producing food-curing smoke or flavour. Other combustible food curing substances include, for example, wood of Oak, pecan, apple, alder, cherry, maple or mesquite, which have unique characteristic flavours. In addition, the smoke dispenser 40 may be electrically heated to cause continuous or intermittent burning of the combustible substances to provide a continuous supply of food-

curing substances such as curing smoke or powder, depending on the desirable type and method of food curing.

A food curing substances circulating means is provided on the main housing to provide continuous circulation of the food curing substances within the food processing compartment for optimal food curing. This circulating means is provided to improve the even distribution of the curing substances as well as for providing an efficient utilization of the smoke or the other food curing substances emanating from the food curing substances dispenser to maximize the curing effect. The food curing substances circulating means includes an air moving device 51 such as a propeller fan which causes forced movement of air within the food processing compartment 31.

To enhance even circulation of the food curing substances within the food processing compartment 31, the air moving device 51 is preferably coupled to a confined channel 52, such as a conduit or a trough enclosed in the main housing. The inlet 53 and outlet 54 of the air channel is preferably separated by a distance comparable to the internal dimension of the food processing compartment for maximum spread of the food curing substances. For example, the inlet 53 and outlet 54 of the air channel can be disposed near the top 22 and bottom 23 ends of the food processing compartment so that the food curing substances would have to travel substantially across the whole compartment before moving from the air channel inlet 53 to the air channel outlet 54. Of course, additional air moving devices can be distributed within the food processing compartment to further

improve the circulation and distribution of the food curing substances within the food processing compartment 31.

Electrical heating means with variable and controllable power levels are preferably also installed on the main housing for heating the food products during the curing process. Preferably, the electrical heating means and the food curing substances circulating means can be separately controlled for flexible operation and utilization.

In order that the food curing substances can be removed from the apparatus without adversely leaving or escaping through the front window 21 when it is opened to remove the cured or cooked food products, an air exhaust passageway 61 connecting the food processing compartment to the outside is provided in the present preferred embodiment. This air exhaust passageway can also be an enclosed channel or a conduit connecting the inner side of the main housing, which is in communication with the food processing compartment 31, and the outside of the main housing 20. A further duct or conduit can be provided to provide further extension of the air passageway to direct the used or residual food curing substances away from the food processing apparatus for appropriate or considered discharge of the used food curing substances.

An air moving device is provided for more effective removal of the used food curing substances from the food processing compartment. The exhaust air passageway 61 is preferably provided with a controllable valve 62 or gate which is normally closed when food products are being cured within the food processing

compartment. The valve 62 will be opened when the curing or cooking process has completed and undesirable residual food curing substances are being removed from the food processing compartment 31.

5 In the present embodiment, a two-way valve which can alternatively close either the air channel 52 or the exhaust air passageway 61 is provided so that the exhaust air passageway 61 could be closed when the food curing substances are being circulated within the food processing compartment.

The circulation air channel 52 may be blocked when the residual food curing substances are being removed from the food processing compartment 31 through the exhaust air passageway. With this two-way valve arrangement, a single propeller fan 51 can be used as a common air moving device for both air circulation and the removal of the residual food curing substances. Of course, separate air moving devices may be used for the food curing substances circulation channel and the exhaust passageway without loss of generality.

15 Furthermore, in order to eliminate, or at least alleviate, the smell associated with the outgoing food curing substances, a deodorizing filter 63 with particle filtering or absorbing features is preferably provided near the exit 64 of the exhaust air passageway. With this additional air filtering and particle absorption arrangement 63, air contamination inside and outside of the premises in which the apparatus is used can be substantially reduced. Of course, the deodorizing filter 63 and the particle absorption means or filter can be used separately or in combination. Preferably, modular filters are provided for easy maintenance and

20

replacements. Activated carbon or charcoal is a good example of substances suitable for use in the deodorizing filter.

While the present invention has been explained by reference to the preferred embodiments described above, it will be appreciated that the
5 embodiments are only examples provided to illustrate the present invention and are not meant to be restrictive on the scope and spirit of the present invention. This invention should be determined from the general principles and spirit of the invention as described above. In particular, variations or modifications which are obvious or trivial to persons skilled in the art, as well as improvements made on
10 the basis of the present invention, should be considered as falling within the scope and boundary of the present invention. Furthermore, while the present invention has been explained by reference to smoke curing, it should be appreciated that the invention can apply, whether with or without modification, to other forms of food curing applications without loss of generality.

15

CLAIMS

1. A food processing apparatus with a main housing including a food processing compartment, electrical heating means, food curing circulation means and food curing substances removal means, said food curing
5 circulation means includes food curing substances dispensing means for dispensing food curing substances into said food processing compartment and air moving means for circulating said food curing substances inside said food processing compartment, said food curing substances removal means includes means to remove said food curing substances from said food
10 processing to outside said main housing.
2. A food processing apparatus according to claim 1, wherein said food substances removal means includes absorption means for absorption said food curing substances at the downstream outlet of said food substances removal means.
- 15 3. A food processing apparatus according to claim 2, wherein said absorption means includes a deodorizing filter.
4. A food processing apparatus according to claim 1, said main housing further includes a confined channel with an air inlet and an air outlet, said confined channel being in communication with an air moving device, said air moving
20 device being disposed to move said curing substances from said air inlet to said air outlet through said confined air channel and for subsequent circulation in said food processing compartment.

5. A food processing apparatus according to claim 4, wherein said food curing substances removal means includes an air channel in communication with said air moving device.
6. A food processing apparatus according to claim 5, wherein a flow control means is provided to selectively connect said air moving device to be in communication with said air channel of said food curing substances removal means or said air channel of said air moving means which forms a part of the circulating path of said food curing substances within said food processing compartment.
7. A food processing apparatus according to claim 6, wherein said flow control means includes a two-way valves.
8. A food processing apparatus according to claim 1, further including flow control means to selectively and alternatively activate said food curing circulation means or said food curing substances removal means.

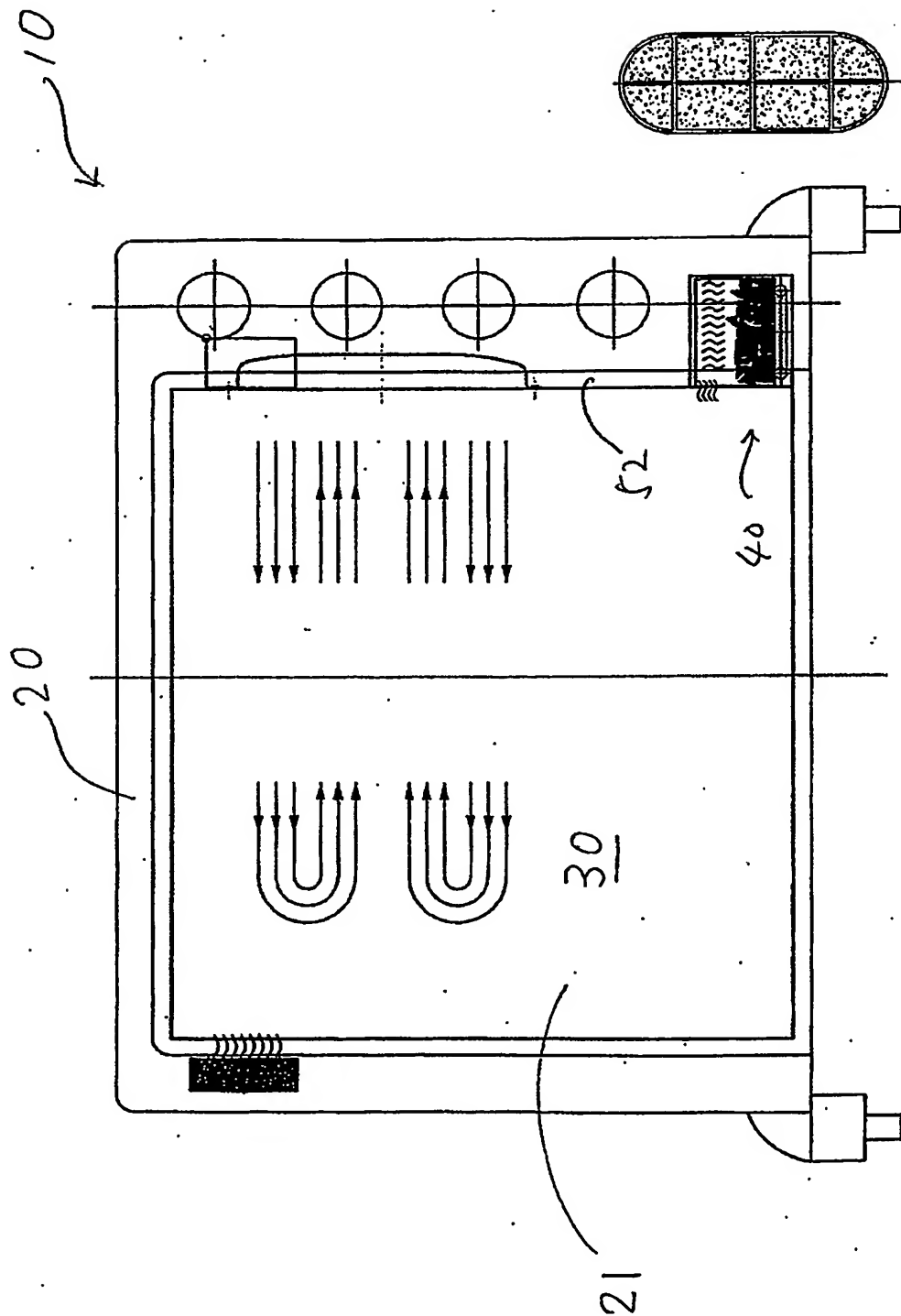


Fig. 1

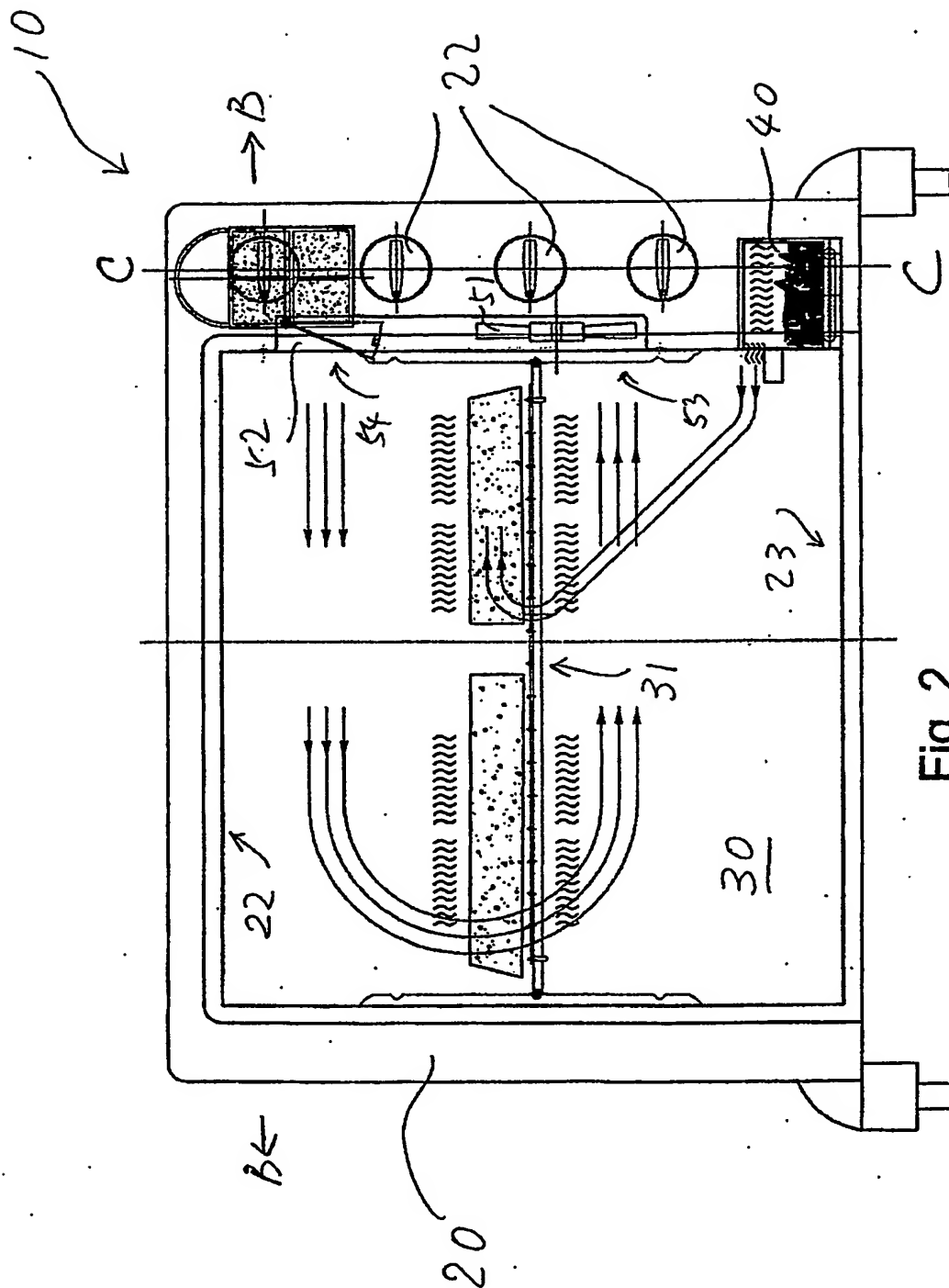


Fig. 2

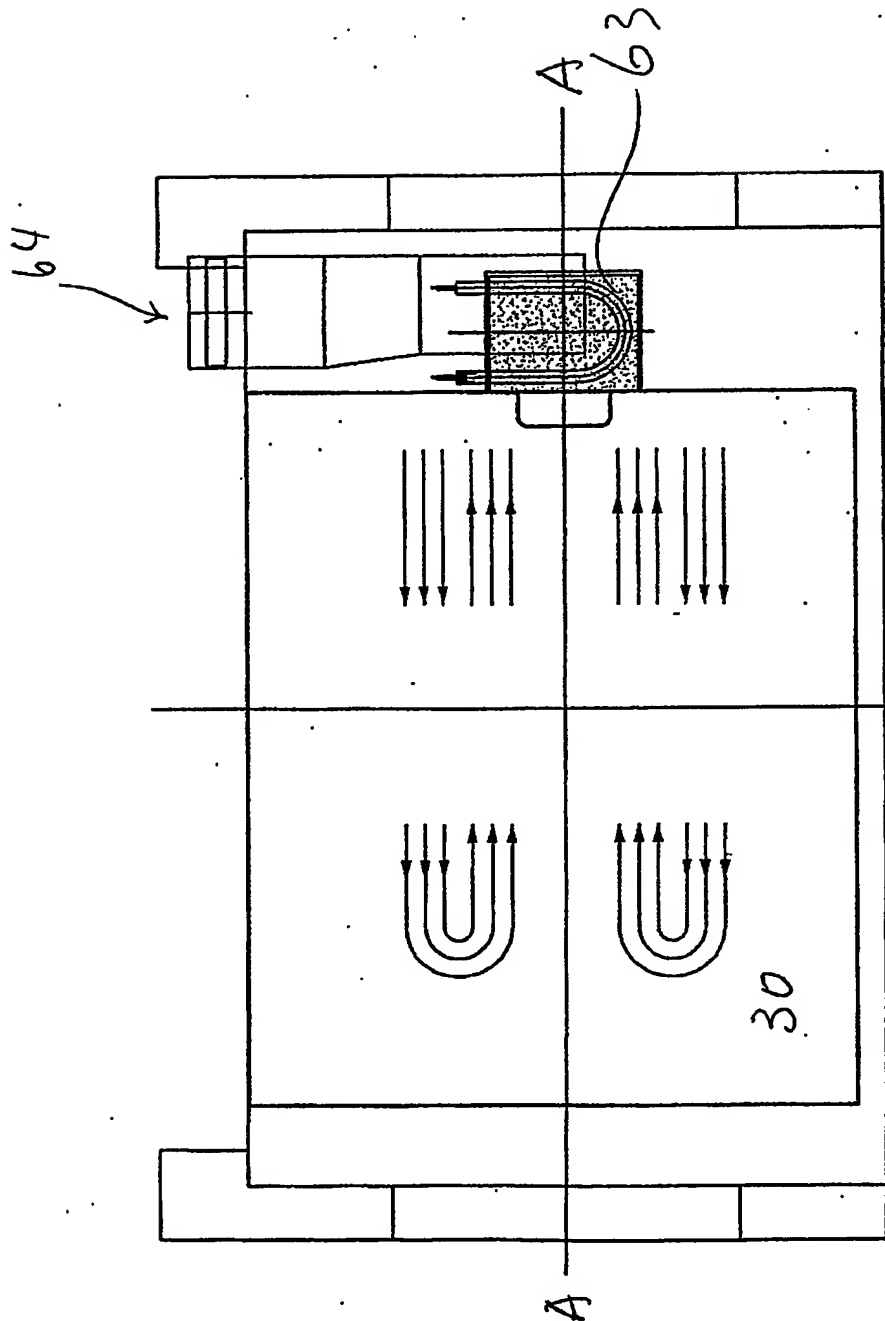


Fig. 3

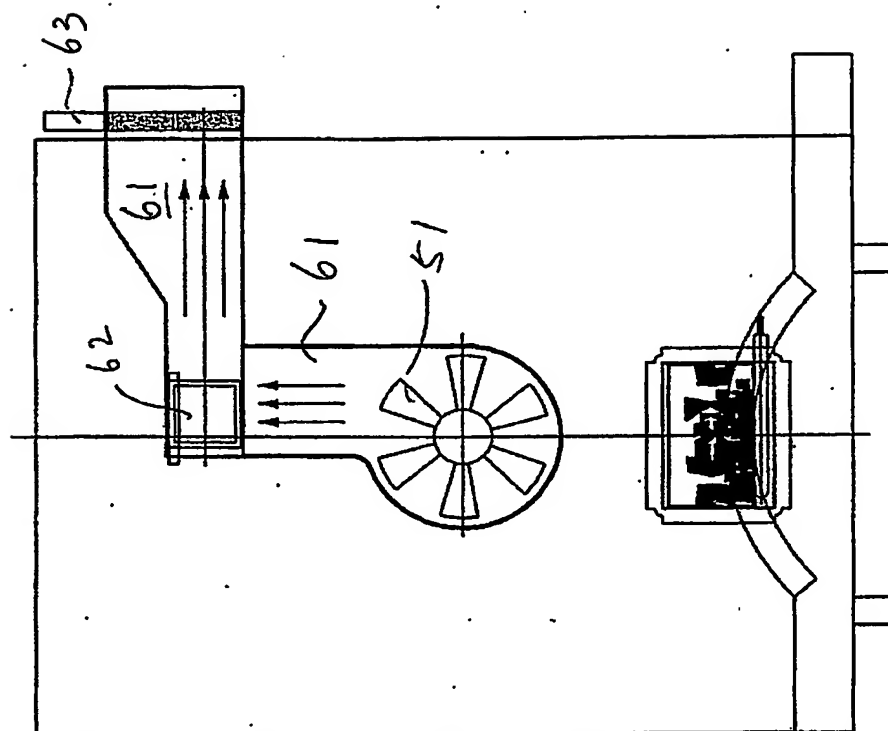


Fig. 4

ABSTRACT

A food processing apparatus with electrical heating means as well as smoke curing capability so that food products can be smoke-cured and cooked
5 simultaneously. The food processing apparatus is provided with means to circulate the food curing substances (the flavouring smoke) within an enclosed food processing compartment. An exhaust air passageway provided with a controllable valve and connected with particle absorption and deodorizing means to purify the exhaust air when the food curing smoke is removed from the enclosed food
10 processing compartment is also included to alleviate or eliminate air contamination in the vicinity of the food processing apparatus.